What is claimed is:

1. A method for clock and carrier recovery at a receiver of a direct sequence spread spectrum communication system, the clock and carrier recovery being accomplished using a predefined training sequence or unknown data sequence, each symbol of the predefined training sequence being spread by a predefined spreading sequence, the predefined training sequence being transmitted on a channel by a transmitter, a signal corresponding to the transmitted training sequence being received by the receiver, the method comprising the steps of:
    a. down-converting the received signal to convert it to baseband of the frequency spectrum;
    b. sampling the down-converted signal at a pre-defined sampling rate to obtain samples of the received signal;
    c. estimating the symbol boundary using the samples of the received signal;
    d. computing the maximum likelihood estimate of the mean of the phase error;
    e. computing the maximum likelihood estimate of the carrier frequency offset using the maximum likelihood estimate of the mean of the phase error; and
    f. computing the maximum likelihood estimate of the clock error.
2. The method as recited in claim 1 wherein the step of computing the maximum likelihood estimate of the mean of the phase error comprises the steps of:
    a. setting a counter to an initial value of zero;
    b. buffering *M* samples of the signal with boundary alignment, where *M* is a pre-defined number;

c. decimating to retain *N* samples of the *M* buffered samples, where *N* is the length of the pre-defined spreading sequence;

d. de-spreading the decimated samples of the down-converted signal using the pre-defined spreading code to obtain a sequence of de-spread symbols;

e. forming a differential symbol using the de-spread symbols;

f. extracting the phase angle of the differential symbol;

g. performing a symbol decision on the phase angle;

h. computing the phase error introduced in the transmitted signals;

i. accumulating the phase error using maximum likelihood weighting scheme;

j. incrementing the value of the counter by unity; and

k. repeating steps b-j until the value of the counter reaches a value *L*, *L* being the estimation length in terms of the number of Differential Binary Phase Shift Keying symbols.

3. The method as recited in claim 2 wherein the step of accumulating the phase error comprises accumulating the phase error using the maximum likelihood weighting scheme.

4. A system for clock and carrier recovery at a receiver of a direct sequence spread spectrum communication system, the clock and carrier recovery being accomplished using a predefined training sequence or unknown data sequence, each symbol of the predefined training sequence being spread by a predefined spreading sequence, the predefined training sequence being transmitted on a

channel by a transmitter, a signal corresponding to the transmitted training sequence being received by the receiver, the system comprising:

a. a Down Converter down-converting the received signal to convert it to baseband of the frequency spectrum;

b. a Sampler sampling the received signal at a predefined sampling rate to obtain samples of the received signal;

c. a Symbol Boundary Estimator estimating a symbol boundary using the samples of the received signal;

d. a Phase Error Estimator computing the maximum likelihood estimate of the mean of the phase error;

e. a Carrier Frequency Offset Estimator computing the maximum likelihood estimate of the carrier frequency offset; and

f. a Clock Error Estimator computing the maximum likelihood estimate of the clock error.

5. The system as recited in claim 4 wherein the Phase Error Estimator comprises:

a. a Buffer buffering *M* samples of the signal with boundary alignment, where *M* is a pre-defined number;

b. a Decimator decimating the buffered samples to retain *N* samples of the *M* buffered samples, where *N* is the length of a pre-defined spreading sequence;

c. a De-spreader de-spreading the decimated samples of the down-converted signal using the pre-defined spreading code to obtain a sequence of de-spread symbols;

d. a Differential Symbol Calculator forming a differential symbol using the de-spread symbols;

e. a Phase Angle Extractor extracting the phase angle of the differential symbol;

f. a Symbol Decider performing a symbol decision on the phase angle;

g. a Phase Error Calculator computing the phase error introduced in the transmitted signals; and

h. a Phase Error Accumulator accumulating the phase error using the maximum likelihood weighting scheme.

6. A computer program product for clock and carrier recovery at a receiver of a direct sequence spread spectrum communication system, the clock and carrier recovery being accomplished using a predefined training sequence or unknown data sequence, each symbol of the predefined training sequence being spread by a predefined spreading sequence, the predefined training sequence being transmitted on a channel by a transmitter, a signal corresponding to the transmitted training sequence being received by the receiver, the computer program product comprising:

a computer readable medium comprising:

a. instruction means for down-converting the received signal to convert it to baseband of the frequency spectrum;

b. instruction means for sampling the down-converted signal at a pre-defined sampling rate to obtain samples of the received signal;

c. instruction means for estimating the symbol boundary using the samples of the received signal;

d. instruction means for computing the maximum likelihood estimate of the mean of the phase error;

e. instruction means for computing the maximum likelihood estimate of the carrier frequency offset using the maximum likelihood estimate of the mean of the phase error; and

f. instruction means for computing the maximum likelihood estimate of the clock error.

7. The computer program product as recited in claim 6 wherein the instruction means for computing the maximum likelihood estimate of the mean of the phase error comprises:

a computer readable medium comprising:

a. instruction means for setting a counter to an initial value of zero;

b. instruction means for buffering *M* samples of the signal with boundary alignment, where *M* is a pre-defined number;

c. instruction means for decimating to retain *N* samples of the *M* buffered samples, where *N* is the length of a pre-defined sequence;

d. instruction means for de-spreading the decimated samples of the down-converted signal using the pre-defined spreading code to obtain a sequence of de-spread symbols;

e. instruction means for forming a differential symbol using the de-spread symbols;

f. instruction means for extracting the phase angle of the differential symbol;

g. instruction means for performing a symbol decision on the phase angle;

h. instruction means for computing the phase error introduced in the transmitted signals;

i. instruction means for accumulating the phase error using the maximum likelihood weighting scheme;

j. instruction means for incrementing the value of the counter by unity; and

k. instruction means for repeating steps b-j until the value of the counter reaches a value *L*, *L* being the estimation length in terms of the number of Differential Binary Phase Shift Keying symbols.